station ratings will reduce the average aggregate ratings of all independent stations per market.

In the longer run, the reduced average station ratings will have a negative impact upon the number of independents. As these independent stations disappear, the aggregate ratings of all independents will diminish.

While we know that the historical impacts of PTAR will be reversed with its repeal, we do not know the size of these reversed impacts. The analysis of the summary statistics does not incorporate the changes in the structure of the industry that occurred over the 1966-1993 period. These changes have modified the current impacts of PTAR and will modify the future impacts of its repeal.

Econometric analysis is required to incorporate these other factors, in order to more precisely estimate the impacts of PTAR's repeal. We now turn to that analysis.

III. ECONOMETRIC ANALYSIS

A. OVERVIEW

The comparison of means presented in the previous section attributes observed changes in the performance of independent stations solely to the enactment of PTAR. Econometric analysis allows us to identify and measure the effects of PTAR while correcting for other factors that may have affected station performance. This correction is required in order to estimate the net impact of PTAR and to accurately predict the future impacts of the repeal of PTAR.

A more refined hypothesis is that PTAR influenced the performance of independent stations in the largest 30 markets, everything else being equal. We can test this hypothesis with the following regression model:

Equation (D.1) $$P_{mt} = F(X_t, Z_{mt}, \text{PTAR Dummy}_{mt}, T71) + e_{mt}$$

where P_{mt} is a measure of independent station performance in market m and time period t; e_{mt} is a measure of remaining residual error; and all other variables are defined below.

We denote the independent station performance measures introduced in **Section II** as follows. The number of independent stations in market m in year t is denoted $Nind_{mt}$. The ratings of the average station in market m and year t is denoted as $AVRATSTA_{mt}$. This average is defined over all independent stations in market m and year t for all weekdays in November of year t. $AVRATSTA_{mt}$ is estimated for the access period and all three programming periods. Finally, the aggregate ratings of all independent stations in market m and year t is denoted $AVSUMRAT_{mt}$, which is also estimated for the access period and all three programming periods.

In regression Equation (C.1), the impact of PTAR is summarized by two variables: a binary variable, PTAR $Dummy_{mt}$, and a variable measuring the time since the enactment of PTAR, T71. PTAR $Dummy_{mt}$ is set equal to 1 for those markets (m) and years (t) in which PTAR was in effect and set equal to 0 otherwise.[5] The impacts of PTAR over time are described by a time trend variable (T71) that runs from the enactment of PTAR through the end of the period of analysis, 1993.

Regression **Equation (D.1)** also includes and corrects for important variables <u>other</u> than PTAR for time period t and market m. We denote the variables that change <u>over time</u> as X_t, which includes population, income and tastes. We denote the variables that vary <u>over markets</u> as Z_m, which summarizes differences over regions in population, income and taste.

The specific variables included as X_t and Z_m are the following. The variable names are presented in brackets:

- TV Households [TVHH] in the ADI
- Percentage of TVHH in the ADI with Cable [%CAB]

[5] The variables are defined more completely in **Section V.** Much of the data used here are Arbitron market data delineated by Area of Dominant Influence, ADI.

- Percentage of TVHH in the ADI with UHF reception [%UHF]
- Average real per capita income [PCI] in ADI
- The number of independent stations in the market [Nind]

Given the correction for these other factors (X_t and Z_m), the regression estimates for PTAR $Dummy_{mt}$ and T71 in Equation (1) will measure the net effect of PTAR. If the implementation of PTAR had a statistically significant effect upon the performance variable P_{mt}, then the estimated regression coefficient for PTAR $Dummy_{mt}$ will be positive and statistically significant. The size of the estimated coefficient will indicate the average size of the effect of PTAR on the performance variable in these markets, everything else being equal. If the effect of PTAR on the performance variable P_{mt} varied over time then the estimated regression coefficient for T71 will be statistically significant, and the size of the estimated coefficient will measure this variation over time, everything else being equal.

B. Econometric Specifications and Regression Results

In this section, we report results for two sets of models[6]:

- Models explaining the growth in the number of independent stations per market; and
- Models explaining the per market ratings of an average independent station.

The econometric results are summarized in **Tables D.3 and D.4.** Each Table first presents the general regression equation to be estimated. The estimated results are then presented for several alternative model formulations.

We now discuss each set of results in turn.

Models explaining the growth in the number of independent stations per market

[6] We also specified and estimated models explaining the aggregate ratings per market (AVSUMRAT) of all independent stations. These models merely summarize the two models reported in the text and we do not report those results here.

In our sample, the number of independent stations per market varies from one to seven for different alternative markets and alternative years. Some smaller markets support only one independent station over all sample years, 1966-1993. Other markets such as Chicago, had three independent stations in 1966 and that number grew to seven in 1993.

In general, we expect that the number of independent stations in a given market (Nind) will be positively affected by the size and wealth of the market, which we measure by the number of TV households (TVHH) and real per capita income (PCI). We also expect that the penetration of UHF reception in the viewing area (%UHF) will have a positive effect upon Nind. We had expected that cable penetration directly affected the number of independent stations.[7] However, because our data base excludes most of the years (1980 through1990) over which this effect occurred, we could not estimate the effect. If PTAR had an immediate effect upon the number of independent stations, the variable PTAR $Dummy_{mt}$ would be statistically significant. If PTAR had a longer run impact upon the number of stations, we expect that the trend since the passage of PTAR, T71, will be statistically significant.

The equations reported in **Table D.3** present only those independent variables that proved statistically significant in explaining the number of independent stations per market.[8] In the logit regression[9], we find that the number of TV households, and the percent of household receiving UHF signals had positive effects upon the number of independent stations, Nind. In the linear regression, we find that income, the number of TV households and the percent of household receiving UHF signals had positive effects upon the number of independent stations.

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[7] Specifically, we expected the cable effect to be nonlinear -- an initial positive antenna effect and subsequent negative competitive effect.

[8] All results are generalized least squares. See Appendix C.

[9] The logit regression relates a measure of proportional growth in the number of independent stations to the independent variables. Specifically, if the total number of independent stations in market m at the end of the period of analysis is $Nind_{m,1993}$, then the proportion of this total in place in year t is $Pnind_{mt} = Nind_{mt}/Nind_{m,1993}$. The logit regression explains the proportional growth of independent stations by expressing the dependent regression variable as the ratio of the proportion of stations in the market in year t ($Pnind_{mt}$) relative to the proportion of stations remaining to enter the market ($1-Pnind_{mt}$). This form of the dependent variable is developed more completely in Section V.

Having corrected for these effects, the logit regression indicates that there was no short-run impact from the enactment of PTAR. In the longer run (after approximately 5 years), PTAR does induce a measurable increase in the number of stations. TVHH and %UHF have positive effects upon the growth in the number of stations. However, the logit formulation indicates that these positive effects diminish as markets become larger and exhibit greater UHF penetration.

The linear regression corroborates these conclusions. Specifically, having corrected for the impacts of income, TVHH and UHF penetration, we find that the

Table D.3

Analysis Of The Number Of Independent Stations Per Market

Equation Estimated

$$Nind = F(PCI, TVHH, \%UHF, T71, T71^2)$$

Estimated Regression Coefficients

Form of F	Intercept	PCI	TVHH	%UHF	T71	$T71^2$
Logit	-1.6055	—	$3.42*10^{-7}$	1.401	-0.065	0.0064
	(-5.56)		(9.80)	(3.54)	(-1.89)	(3.41)
		$R^2 = .38$		$F = 40.02$		$N = 271$
Linear	—	$1.22*10^{-4}$	$5.00*10^{-7}$	1.024	-0.100	0.00319
		(3.42)	(12.68)	(5.00)	-(-3.25)	(2.46)
		$R^2 = .89$		$F = 573.4$		$N = 355$

Notes:

1. t statistics for H_0: coefficient = 0 in parentheses.
2. In the logit form of F, the dependent variables is the log odds ratio, Log [$Pnind_{mt}/(1-Pnind_{mt})$], where $Pnind_{mt}$ is the percent of independent station in market m and year t, defined as $Pnind_{mt} = Nind_{mt}/Nind_{m,1993}$.
3. In the linear form of F, the dependent variable is the number of independent stations in market m and year t ($Nind_{mt}$).
4. More detailed econometric discussion is provided in **Section V.**

long-run effect of PTAR is positive and occurs approximately 15 to 18 years after implementation.

These results indicate that PTAR had a positive and statistically significant impact upon the growth of the number of independent stations. This impact was long run. It revealed itself somewhere between 5 and 15 years from its enactment.

This interpretation reflects both an assessment of the completeness of our underlying data base and an understanding of the nature of entry during the post-PTAR period. Based upon the summary statistics presented in Section II, it is clear that much of the entry occurred in the years 1980 through 1986, years for which we have no data. This timing accords with economic theory, which suggests that the impact of improved ratings and station profitability over 1971 through 1976 would induce entry between 1977 and 1987. However, because we have no data for the period during which the entry did indeed occur, the econometric estimates of the time pattern of impact are fairly broad (i.e., 5 to 15 years).[10]

Models explaining the per market ratings of an average independent station

[10] The fact that the average number of stations per market varied somewhat around 2 over 1971-1976 accounts for the negative regression coefficient for T71, in spite of the fact that the average number of stations was not statistically different year to year.

We found in **Section II** that average station ratings increased immediately, substantially and in a statistically significant fashion with the enactment of PTAR. This increase continued into Period 3. However, the increase did diminish from Period 2.

These findings argue for testing the following regression hypotheses:

- The implementation of PTAR had an immediate and positive effect upon independent station performance.
- The positive impact of PTAR upon station performance varied over time and may have diminished over time.

Furthermore, since regression analysis allows us to include other factors determining station performance, we will be able to test the following additional hypotheses:

- The availability and penetration of cable into the market had a negative effect upon the performance of independent stations.
- The number of independent stations competing in a given market diminished the performance of the average independent station in that market.
- The positive effect of PTAR upon station performance varied with market size, where market size is measured by both the number of TV households in the market and the real per capita income of the viewers in the market.
- Specifically, we hypothesize that the effect of PTAR was relatively less in the largest markets because such markets could more easily support an average independent station. However, we also hypothesize that PTAR was and continues to be very important all but the largest markets.
- The positive effect of PTAR per station varies with the total number independent stations in the market. PTAR has been and will continue to be relatively more important in markets with fewer independent stations because its effects are less diffused.

We will test these hypotheses with the following regression equation, which is a version of **Equation (D.1)**:

Equation (D.2) $AVRATSTA_{mt} = F(PCI_{mt}*TVHH_{mt}, \%CAB_{mt}, Nind_{mt}, PTAR\ Dummy_{mt},$

$T71_t, T71_t^2, T71_t^3, PTAR\ Dummy_{mt}*PCI_{mt}*TVHH_{mt},$

$PTAR\ Dummy_{mt}*Nind_{mt})$

where the performance measure P_{mt} is the average station rating $AVRATSTA_{mt}$, and the other variables are defined above (and in **Section V**).

Some comments regarding the independent variables are useful. First of all, I use $PCI_{mt}*TVHH_{mt}$ as my measure of market size. It is defined to be the product of real per capita income and the number of TV households in market m in year t. This product provides an overall measure of the size and wealth of the market. $\%CAB_{mt}$ and $Nind_{mt}$ have been defined above and measure the competitive effect upon a given independent station of cable TV and other independent stations.

Having corrected for the size and wealth of the market, in addition to the presence of competition, the estimated coefficient of $PTAR\ Dummy_{mt}$ will measure the <u>average</u> per-station effect of PTAR over the entire post-PTAR period.

However, we have hypothesized that this average effect varied over time and over markets. To capture the differential effect of PTAR over time, I introduce the variables T71, $T71^2$ and $T71^3$ which allow for the PTAR effect to vary non-linearly.[11] To capture the differential effect of PTAR over markets, I introduce the variables $PTAR\ Dummy_{mt}*PCI_{mt}*TVHH_{mt}$ and $PTAR\ Dummy_{mt}*Nind_{mt}$. If the effect of PTAR varied with the size of the market, the estimated coefficient of $PTAR\ Dummy_{mt}*PCI_{mt}*TVHH_{mt}$ will be statistically significant. If the effect of PTAR varied with the amount of competition caused by other independent stations, the estimated coefficient of $PTAR\ Dummy_{mt}*Nind_{mt}$ will be statistically significant.

[11] These three variables allow for the effect to move cyclically over time.

We estimate **Equation (D.2)** using data over the entire sample period, 1966-1993. The results are presented in **Table D.4.** While I tested the complete regression, only those estimated coefficients that were statistically significant are reported.[12] Results from the linear model are reported.[13]

The first equation in **Table D.4** models the effect of PTAR on ratings during all three programming periods. In that equation, the coefficient of the PTAR Dummy is 0.0152, which indicates that the first-order effect of PTAR was to increase ratings 1.52 ratings points each and every year of the post-PTAR period.

Furthermore, PTAR had positive second-order effects, indicating that PTAR's positive effect increased over time.[14] Notice that this conclusion elaborates upon and is distinct from the conclusion flowing from the comparison of means in **Section II.** In **Section II,** we found that the positive effect of PTAR diminished over time into Period 3. Because the regression analysis allows us to correct for all other factors not included in the comparison of means, we now find that the positive effect of PTAR continued and increased throughout Periods 2 and 3, everything else being equal. Whatever diminution was observed in **Section II** was due to factors other than PTAR. The regression analysis indicates that PTAR worked to overcome those other factors.

The regression analysis also indicates that the positive effect of PTAR over time was counteracted by a decline induced by the increase in the size and wealth of the markets.[15] This latter effect indicates that as markets get larger and more wealthy generally, the average independent station relies less upon PTAR for its ratings. This means that the positive effect of PTAR is diminished, but not necessarily eliminated, in larger markets. Indeed, as developed more fully below, the positive effects of PTAR were felt in all but the largest market, New York City.

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[12] These final regression estimates were developed using standard statistical tests.
[13] Estimates of the logit model corroborated these results.
[14] This effect is measured by the coefficient of $T71^2$ (0.00004).
[15] This effect is measured by the coefficient of PTAR Dummy*PCI*TVHH, which is -0.0000003021.

The second equation in **Table D.4** models the effect of PTAR on ratings during the access period. In this case, the coefficient of the PTAR Dummy is 0.0339, indicating that the first-order effect of PTAR was much larger than it was for all three programming periods. Hence, PTAR increased independent station ratings 3.39 ratings points during the access period each and every year post-PTAR period. The full impact of PTAR involved second-order effects that were similar to but more simple than those found above. Specifically, PTAR's positive effect declined as markets grew in size and wealth,[16] again because the average independent station relied less upon PTAR for its ratings as markets get larger and more wealthy. This decline with market size diminished, but did not eliminate, the positive effect of PTAR. Specifically, the positive effects of PTAR during the access period were

[16] Again, the effect is measured by the coefficient of PTAR Dummy*PCI*TVHH, which is, in this case, -0.0000003501.

Table D.4

Analysis Of The Ratings Of An Average Station

Equation Estimated

AVRATSTA = F(PCI*TVHH, %CAB, Nind, PTAR Dummy, T71, $T71^2$, $T71^3$,

PTAR Dummy*PCI*TVHH, PTAR Dummy*Nind)

Estimated Regression Coefficients

C	PCI*TVHH	%CAB	PTAR Dummy	$T71^2$	PTAR Dummy*PCI*TVHH	Nind
.034	$5*10^{-7}$	-.0193	.0152	$4*10^{-5}$	$-3*10^{-7}$	-.006
(19.32)	(10.41)	(-3.06)	(7.56)	(4.87)	(-5.77)	(-13.42)

R^2=.20 F=45.02 N=1065

.041	$5.9*10^{-7}$	-.018	.034	——	$-3.5*10^{-7}$	-.008
(14.57)	(7.54)	(-3.52)	(9.87)		(-4.00)	(-14.36)

R^2=.62 F=113.82 N=355

found in all markets and all years except for the largest market, New York City, in 1987 and 1993.

In light of this discussion, we see that in order to understand the full effects of PTAR over time and over markets, we must sum the first-order and second-order effects. This is done in **Table D.5**, where we predict the ratings of an average independent station with and without PTAR.[17] The effects of PTAR are tracked over time and for the following three "synthetic" markets[18] based upon the measure of market size (i.e., the product of PCI and TVHH):

- The average market;
- The smallest market; and
- The largest market.

Notice that for all three programming periods, PTAR increased average station ratings by anywhere from 1.04 ratings points to 2.78 ratings points in the average sized market. These effects were considerably larger for the smallest market, increasing average station ratings by 1.34 to 3.30 ratings points. For the largest market, the effect of PTAR was modestly negative over 1971 to 1993. The impact of PTAR in all three markets increased for the most part through 1993.

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[17] This calculation is performed as follows. Assume that the estimated regression takes the form, $P_{mt} = a\,X_{mt} + b\,Z_{mt} + c\,\text{PTAR Dummy}_{mt} + d\,\text{T71}$. Assume further that X_{mt} is the measure of market size (PCI*TVHH) in market m and year t, and Z_{mt} includes all other non-PTAR variables (e.g., $\%CAB_{mt}$, $Nind_{mt}$) in the regression. Given values of X_{mt} and Z_{mt} for market m and year t, the average rating induced by PTAR and all other factors is $P_{mt}^{*} = a\,X_{mt} + b\,Z_{mt} + c\,\text{PTAR Dummy}_{mt} + d\,\text{T71}$. The average rating that would have occurred absent PTAR is $P_{mt}^{a} = a\,X_{mt} + b\,Z_{mt}$, since absent PTAR, $\text{PTAR Dummy}_{mt} = 0$ for all m and t and T71 = 0 for all t. The net or incremental impact of PTAR is therefore $P_{mt}^{*} - P_{mt}^{a}$.

[18] The three markets are synthetic in the sense that they do not embody actual data for the actual markets. Rather, the markets are designed to measure the greatest variation possible in the effects of PTAR due to market size alone.

More specifically, using the notation of the preceding footnote, in each year the average market is defined by the mean values of all socioeconomic variables X_{mt} and Z_{mt}, including market size (PCI*TVHH). The smallest and largest markets are defined by the smallest and largest size values (PCI*TVHH) for that year, in addition to the mean values of all other socioeconomic variables. Hence, variations in the measure of market size are the only descriptors that vary over the three markets.

For the access period, PTAR increased average station ratings in the average sized market by anywhere from 2.4 to 2.8 ratings points. As above, these effects were considerably larger for the smallest market, increasing average station ratings by 3.00 to 3.20 ratings points. For the largest market, the effect of PTAR was mixed, sometimes being positive and sometimes being modestly negative. In the access period, the impact of PTAR on all three markets diminished through 1993.

In order to better understand the distribution of PTAR's positive effects across markets of varying size, **Table D.6** elaborates upon the results in **Table D.5.** Specifically, **Table D.6** calculates the net impact of PTAR over time for each of the 30 sample markets.[19] The impact is measured in terms of average station ratings for the access period.

The Table indicates that the effect of PTAR was uniformly positive over all years in all markets, except the single largest market, New York City. Within New York City, the effect of PTAR was positive for all of Period 2 and only became modestly negative in 1987. Hence, even when we account for the decline in the positive impact of PTAR as markets increase in size, we find that the impact has become negative only for New York City and only recently.[20] The positive effect remains substantial for all other markets in the top 30 markets.

[19] Because the purpose of this Table is to better clarify the effects of market size, the calculation is the same as described in footnotes 16 and 17. The values of all socioeconomic variables other than market size are set to the mean values for that year, while actual market size (PCI*TVHH) is included for each market.

Some care must be exercised in interpreting the results because different cities may appear in a given market rank over time.

[20] When we analogously calculate the overall effects of PTAR for all three programming periods, the effect is positive for all markets except New York City, which reveals a modest negative effect for all years 1971-1993.

Incremental Effect of PTAR By Year

All Programming Periods

		1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1979	1987	1993
Average Size Market	W/PTAR	0.03264316	0.031767	0.030698189	0.030652	0.029914	0.041185	0.041529	0.039543	0.039884	0.039342	0.041362	0.042315	0.035718	0.041309
	W/O PTAR	0.03264316	0.031767	0.030698189	0.030652	0.029914	0.030721	0.031145	0.029191	0.029198	0.028349	0.030025	0.029838	0.016622	0.01346
	Incremental Effect	0	0	0	0	0	0.010464	0.010384	0.010352	0.010687	0.010993	0.011337	0.012477	0.019096	0.027849
Smallest Market	W/PTAR	0.02681233	0.0257215	0.024879553	0.024797	0.024423	0.039217	0.039534	0.037398	0.037782	0.037243	0.039276	0.039674	0.032562	0.037879
	W/O PTAR	0.02681233	0.0257215	0.024879553	0.024797	0.024423	0.025797	0.026152	0.023826	0.023938	0.023097	0.024808	0.023233	0.008728	0.00488
	Incremental Effect	0	0	0	0	0	0.01342	0.013381	0.013573	0.013844	0.014146	0.014468	0.016441	0.023834	0.032999
Largest Market	W/PTAR	0.05806365	0.060485	0.061825155	0.062668	0.063639	0.054776	0.056266	0.054282	0.054191	0.053929	0.055802	0.057089	0.055045	0.062192
	W/O PTAR	0.05806365	0.060485	0.061825155	0.062668	0.063639	0.064717	0.068008	0.066061	0.064987	0.064836	0.066146	0.066796	0.064969	0.065699
	Incremental Effect	0	0	0	0	0	-0.00994	-0.01174	-0.01178	-0.0108	-0.01091	-0.01034	-0.00971	-0.00992	-0.00351

Access Period

Average Size Market	W/PTAR	0.03737135	0.0363358	0.034888773	0.034735	0.033866	0.063199	0.063483	0.061576	0.06131	0.060168	0.062465	0.06145	0.043901	0.039664
	W/O PTAR	0.03737135	0.0363358	0.034888773	0.034735	0.033866	0.03488	0.035397	0.033759	0.03343	0.03235	0.03476	0.034512	0.018946	0.015703
	Incremental Effect	0	0	0	0	0	0.028318	0.028087	0.027817	0.02788	0.027818	0.027705	0.026938	0.024955	0.023961
Smallest Market	W/PTAR	0.0305048	0.0292163	0.028036586	0.02784	0.0274	0.060825	0.061077	0.05899	0.058775	0.057636	0.05995	0.058266	0.040096	0.035529
	W/O PTAR	0.0305048	0.0292163	0.028036586	0.02784	0.0274	0.029082	0.029517	0.02744	0.027236	0.026165	0.028615	0.026733	0.00965	0.005599
	Incremental Effect	0	0	0	0	0	0.031744	0.03156	0.03155	0.031539	0.031471	0.031335	0.031533	0.030447	0.02993
Largest Market	W/PTAR	0.06730722	0.0701548	0.071544749	0.072438	0.073582	0.079586	0.081252	0.079348	0.078561	0.077755	0.079876	0.079264	0.067205	0.064845
	W/O PTAR	0.06730722	0.0701548	0.071544749	0.072438	0.073582	0.074915	0.078807	0.077178	0.075577	0.075318	0.077297	0.078035	0.075881	0.077221
	Incremental Effect	0	0	0	0	0	0.00467	0.002445	0.00217	0.002985	0.002437	0.002579	0.001229	-0.00868	-0.01238

Table D.5

Incremental Effect of PTAR by Year

Access Period

	1971	1972	1973	1974	1975	1976	1979	1987	1993
Market 1	0.0047	0.0024	0.0022	0.0030	0.0024	0.0026	0.0012	-0.0087	-0.0124
Market 2	0.0191	0.0180	0.0177	0.0174	0.0171	0.0157	0.0129	0.0078	0.0069
Market 3	0.0219	0.0211	0.0203	0.0203	0.0207	0.0208	0.0189	0.0165	0.0152
Market 4	0.0250	0.0245	0.0241	0.0242	0.0241	0.0239	0.0227	0.0194	0.0180
Market 5	0.0275	0.0268	0.0267	0.0267	0.0266	0.0233	0.0215	0.0178	0.0161
Market 6	0.0276	0.0249	0.0247	0.0243	0.0240	0.0265	0.0255	0.0216	0.0210
Market 7	0.0254	0.0270	0.0266	0.0269	0.0269	0.0265	0.0257	0.0248	0.0214
Market 8	0.0283	0.0282	0.0280	0.0274	0.0273	0.0268	0.0263	0.0248	0.0238
Market 9	0.0288	0.0280	0.0276	0.0281	na	0.0280	0.0273	0.0235	0.0243
Market 10	na	na	na	0.0295	0.0294	0.0291	0.0280	0.0268	0.0253
Market 11	0.0301	0.0296	0.0294	0.0293	0.0294	0.0293	0.0287	0.0267	0.0256
Market 12	0.0313	0.0301	0.0299	0.0300	0.0301	0.0294	0.0280	0.0269	0.0259
Market 13	0.0312	0.0303	0.0300	0.0300	0.0299	0.0296	0.0289	0.0269	0.0244
Market 14	0.0304	0.0307	0.0304	0.0301	0.0299	0.0300	0.0293	0.0280	0.0256
Market 15	na	0.0307	0.0303	0.0301	0.0303	0.0299	0.0296	0.0267	0.0280
Market 16	0.0306	0.0308	0.0307	0.0305	0.0306	0.0303	0.0297	0.0282	0.0277
Market 17	0.0317	0.0309	0.0305	0.0309	0.0310	0.0307	0.0289	0.0282	0.0276
Market 18	0.0310	0.0307	0.0307	0.0304	0.0303	0.0300	0.0302	0.0282	0.0277
Market 19	0.0312	0.0309	0.0308	0.0307	0.0307	0.0307	0.0302	0.0284	0.0282
Market 20	na	0.0314	0.0312	0.0309	0.0309	0.0307	na	0.0292	0.0275
Market 21	0.0312	0.0311	0.0300	0.0310	0.0309	0.0308	0.0300	0.0293	0.0288
Market 22	0.0310	0.0314	0.0312	0.0314	0.0311	0.0309	0.0305	0.0289	0.0283
Market 23	0.0316	0.0315	0.0314	0.0312	0.0312	0.0308	0.0306	0.0284	0.0293
Market 24	0.0317	0.0315	0.0312	0.0311	0.0312	0.0310	0.0306	0.0299	0.0291
Market 25	0.0315	0.0313	0.0314	0.0312	0.0312	0.0310	0.0308	0.0296	0.0280
Market 26	na	0.0315	0.0313	0.0313	0.0315	0.0311	0.0306	0.0300	0.0290
Market 27	0.0317	0.0316	na	0.0311	0.0315	0.0313	0.0308	0.0303	0.0292
Market 28	na	na	0.0315	0.0315	0.0311	0.0313	0.0310	0.0301	0.0296
Market 29	0.0317	0.0315	0.0312	na	na	0.0313	0.0312	0.0304	0.0298
Market 30	0.0317	na	na	na	na	na	0.0315	0.0302	0.0299

Table D.6

IV. ANALYSIS OF THE EFFECTS OF THE REPEAL OF PTAR

Because all statistical and econometric analysis makes use of existing data, the estimation process must always summarize economic effects that occurred in the past.

Our analysis proceeds in this fashion, focusing upon the historical period 1966-1993. **Section II** provided an overview of the historical period using sample means of independent station performance, by year and by Period (1-3). These sample means dictate the broad conclusion that PTAR had positive short-run and long-run impacts upon independent station performance. **Section III** provided a more detailed characterization of the short-run and long-run impacts of PTAR. This more detailed characterization allowed us to measure the impacts of other factors upon station performance, thereby separating and estimating the impact of PTAR, net of changes in the structure of the industry. The conclusions of the econometric analysis confirm (and expand upon) the conclusions of **Section II**. PTAR had positive short-run and long-run impacts upon station performance, net of the important structural changes in the industry.

While analysis of the 1966 through 1993 period is important, the primary purpose of this effort is future-oriented. It is to predict, as accurately as possible, the economic impacts of the repeal of PTAR. In order to make the analysis future-oriented while exploiting data that summarize the past, we have specified and estimated descriptive econometric models that explain the simultaneous effects of PTAR and other measures of economic activity and industrial structure. These models identify the current impact of PTAR, netting out changes in market structure. These resulting estimates of net impacts have been presented in **Tables D.5** and **D.6**.

Because the econometric models allow us to estimate the impact of PTAR while accounting for structural changes in the market, these models also allow us to estimate the impacts of the repeal of PTAR, given the changes that have occurred in the market since 1971.

Specifically, we have described our model generically as

Equation (D.1) $P_{mt} = F(X_t, Z_m, \text{PTAR Dummy}_{mt}) + e_{mt}$

where P_{mt} is the performance measure in market m and time period t, which has been and will continue to be affected by the existence of PTAR (PTAR Dummy_{mt}), in addition to all other factors affecting the structure and performance within broadcast markets (X_t and Z_m). The other factors that have affected the impact of PTAR over time and markets have been identified in **Table D.4**. For example, in the second regression of **Table D.4**, we found that the positive impact of PTAR diminished as markets became larger and more wealthy. Hence, while positive, the net impact of PTAR in **Table D.6** was less in 1993 relative to 1971 for all markets precisely because all markets had become larger and more wealthy over the historical period. Likewise, increased competition from cable and other independent stations affected (diminished) the positive impact of PTAR.

These other factors continue to influence the current impact of PTAR and will influence the future impact of PTAR and its repeal.

Using the estimated regression equation in **Table D.4**, we can estimate the future impacts of PTAR and its repeal, taking account of these other factors. Table C.7 presents such estimates. The future impacts on average station ratings for the access period are predicted under both scenarios in all 30 markets. The forecasts are for the 1995-2004 period. These estimates assume that each of the top 30 markets continues to grow in size (specifically, PCI*TVHH) as they grew over the 1966-1993 period. Likewise, cable penetration by market is assumed to grow at the same pace as exhibited over 1973-1993.[21] For this comparison, we do not assume any change in the number of independent stations in each market.

[21] This trend begins in 1973 because cable penetration was essentially nonexistent before that year.

Given these trend assumptions, the average station ratings are predicted for each market under the following assumptions:[22]

- PTAR remains intact and unchanged; and
- PTAR is repealed

The predictions are made for all programming periods (panel A of **Table D.7**) and for the access period (panel B of **Table D.7**).

The results indicate the following. For all programming periods, the repeal of PTAR will have a negative effect upon the ratings of the average independent station in all markets over the 1995-2004 period. The size of the negative effect will vary over time and across markets, and increases as the markets become smaller.

For the access period, the repeal of PTAR will have a negative impact upon average station ratings for all but the largest market, New York City. As above, the size of the negative impact increases as the markets become smaller.

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[22] Using the regression equation in footnote 16, we have $P_{mt} = a\ X_{mt} + b\ Z_{mt} + c$ PTAR Dummy$_{mt}$ + d T71. The stated assumptions regarding trends in market size, cable penetration and the number of independent stations fix the variables X_{mt} and Z_{mt} for all markets m and all years t = 1995-2004.

Given these values of X_{mt} and Z_{mt}, the average rating induced by PTAR in the future is $P_{mt}^{*} = a\ X_{mt} + b\ Z_{mt} + c$ PTAR Dummy$_{mt}$ + d T71, where PTAR Dummy$_{mt}$ remains 1 and T71 continues to grow from 1971.

The average ratings that will occur with the repeal of PTAR in 1995 are calculated as follows. Given repeal, PTAR Dummy$_{mt}$ = 0 for all m and all t = 1995-2004 and the time effects of PTAR will disappear (T71 = 0 for all t). Hence, with repeal, performance is calculated as $P_{mt}^{r} = a\ X_{mt} + b\ Z_{mt}$, which is analogous to P_{mt}^{*} in footnote 16.

The net or incremental impact of the repeal of PTAR is therefore $P_{mt}^{r} - P_{mt}^{*}$.

Table D.7
Incremental Effects of PTAR, By Year

All Time Periods

		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
W/PTAR	Market 1	0.0646296	0.0668004	0.0690611	0.0714113	0.0738504	0.0763778	0.0789931	0.0816958	0.0844856	0.0873621
	Market 2	0.0494624	0.0515285	0.0536847	0.0559303	0.0582648	0.0606876	0.0631983	0.0657964	0.0684816	0.0712536
	Market 3	0.0333701	0.035277	0.037274	0.0393603	0.0415356	0.0437992	0.0461506	0.0485896	0.0511156	0.0537283
	Market 4	0.0455185	0.0474361	0.0494437	0.0515407	0.0537266	0.0560009	0.058363	0.0608126	0.0633492	0.0659726
	Market 5	0.0308416	0.0328934	0.0350353	0.0372665	0.0395866	0.041995	0.0444914	0.0470752	0.0497461	0.0525036
	Market 6	0.038193	0.0400709	0.0420388	0.0440961	0.0462423	0.0484768	0.0507992	0.0532091	0.055706	0.0582897
	Market 7	0.0505511	0.0523875	0.0543138	0.0563296	0.0584343	0.0606273	0.0629082	0.0652766	0.067732	0.0702741
	Market 8	0.0403579	0.042211	0.044154	0.0461865	0.0483079	0.0505176	0.0528152	0.0552002	0.0576723	0.0602312
	Market 9	0.0445716	0.0464336	0.0483855	0.0504268	0.0525571	0.0547756	0.0570821	0.059476	0.061957	0.0645247
	Market 10	0.0513417	0.0531962	0.0551407	0.0571747	0.0592975	0.0615087	0.0638077	0.0661942	0.0686678	0.0712281
	Market 11	0.0434932	0.0453465	0.0472899	0.0493227	0.0514443	0.0536543	0.0559522	0.0583376	0.06081	0.0633691
	Market 12	0.0428365	0.0446966	0.0466468	0.0486863	0.0508148	0.0530315	0.0553362	0.0577283	0.0602075	0.0627734
	Market 13	0.0421571	0.0440396	0.0460121	0.0480741	0.0502249	0.0524641	0.0547912	0.0572057	0.0597073	0.0622956
	Market 14	0.051376	0.0532305	0.0551751	0.0572091	0.0593319	0.0615431	0.0638422	0.0662288	0.0687024	0.0712627
	Market 15	0.0472663	0.0490861	0.0509959	0.052995	0.0550831	0.0572595	0.0595238	0.0618755	0.0643143	0.0668399
	Market 16	0.0345648	0.0363892	0.0383036	0.0403075	0.0424002	0.0445813	0.0468502	0.0492066	0.0516501	0.0541803
	Market 17	0.0456598	0.0474896	0.0494094	0.0514187	0.0535168	0.0557032	0.0579776	0.0603394	0.0627883	0.0653238
	Market 18	0.0388647	0.0406844	0.0425941	0.0445933	0.0466813	0.0488577	0.051122	0.0534737	0.0559125	0.058438
	Market 19	0.0477378	0.0495517	0.0514556	0.0534489	0.0555311	0.0577016	0.05996	0.0623059	0.0647388	0.0672585
	Market 20	0.0491041	0.0509309	0.0528477	0.054854	0.0569491	0.0591325	0.0614039	0.0637627	0.0662085	0.0687411
	Market 21	0.0369458	0.0387456	0.0406354	0.0426146	0.0446827	0.0468391	0.0490834	0.0514152	0.053834	0.0563396
	Market 22	0.0538835	0.0556938	0.0575942	0.059584	0.0616627	0.0638297	0.0660845	0.0684269	0.0708563	0.0733724
	Market 23	0.0386166	0.0404242	0.0423218	0.0443089	0.0463848	0.048549	0.0508012	0.0531408	0.0555675	0.0580808
	Market 24	0.0375652	0.0393503	0.0412254	0.0431899	0.0452434	0.0473851	0.0496148	0.0519319	0.0543361	0.0568269
	Market 25	0.0427519	0.0445675	0.0464731	0.0484681	0.050552	0.0527242	0.0549843	0.0573319	0.0597665	0.0622879
	Market 26	0.04091	0.0427034	0.0445867	0.0465595	0.0486212	0.0507712	0.0530091	0.0553345	0.0577469	0.060246
	Market 27	0.0590834	0.0608742	0.062755	0.0647253	0.0667844	0.0689319	0.0711673	0.0734901	0.0759	0.0783965
	Market 28	0.0484078	0.0502013	0.0520848	0.0540577	0.0561194	0.0582696	0.0605076	0.062833	0.0652456	0.0677448
	Market 29	0.0464086	0.0481838	0.0500491	0.0520038	0.0540473	0.0561792	0.058399	0.0607062	0.0631005	0.0655815
	Market 30	0.0518533	0.053632	0.0555007	0.0574589	0.0595059	0.0616413	0.0638645	0.0661752	0.068573	0.0710575
W/O PTAR	Market 1	0.0653099	0.0661008	0.0669017	0.0677118	0.0685307	0.0693579	0.0701929	0.0710352	0.0718846	0.0727405
	Market 2	0.0344897	0.0350189	0.0355581	0.0361066	0.0366639	0.0372295	0.0378028	0.0383835	0.0389712	0.0395655
	Market 3	0.0100474	0.0101783	0.0103192	0.0104695	0.0106285	0.0107957	0.0109708	0.0111532	0.0113426	0.0115386
	Market 4	0.0196246	0.0197822	0.0199498	0.0201266	0.0203123	0.0205062	0.0207079	0.020917	0.021133	0.0213557
	Market 5	0.0077615	0.0082548	0.0087581	0.0092707	0.0097921	0.0103218	0.0108592	0.011404	0.0119558	0.0125141
	Market 6	0.0097806	0.0098389	0.0099071	0.0099846	0.0100709	0.0101655	0.0102678	0.0103775	0.0104942	0.0106175
	Market 7	0.0202483	0.0202027	0.0201671	0.0201408	0.0201232	0.0201139	0.0201124	0.0201183	0.0201312	0.0201506
	Market 8	0.0093923	0.0093885	0.0093946	0.00941	0.0094342	0.0094667	0.009507	0.0095546	0.0096092	0.0096704
	Market 9	0.013641	0.0136594	0.0136877	0.0137253	0.0137717	0.0138263	0.0138888	0.0139586	0.0140354	0.0141188
	Market 10	0.01884	0.0188398	0.0188496	0.0188687	0.0188965	0.0189327	0.0189766	0.0190279	0.0190861	0.019151
	Market 11	0.0108666	0.0108636	0.0108704	0.0108866	0.0109116	0.0109448	0.0109858	0.0110341	0.0110895	0.0111514
	Market 12	0.009921	0.0099349	0.0099587	0.0099918	0.0100337	0.0100839	0.0101418	0.0102071	0.0102794	0.0103583
	Market 13	0.0101254	0.0101953	0.0102752	0.0103643	0.0104623	0.0105685	0.0106825	0.0108039	0.0109322	0.0110672
	Market 14	0.0182291	0.0182291	0.0182389	0.0182581	0.018286	0.0183222	0.0183662	0.0184176	0.0184759	0.0185409
	Market 15	0.0130657	0.0129785	0.0129013	0.0128335	0.0127744	0.0127235	0.0126805	0.0126448	0.0126161	0.012594
	Market 16	0.0001426	6.713E-05	1.624E-06	-5.456E-05	-0.000102	-0.0001411	-0.0001725	-0.0001965	-0.0002135	-0.0002239
	Market 17	0.0113412	0.0112792	0.0112272	0.0111845	0.0111505	0.0111249	0.011107	0.0110964	0.0110929	0.0110959
	Market 18	0.0043379	0.0042508	0.0041735	0.0041056	0.0040464	0.0039955	0.0039524	0.0039167	0.0038879	0.0038658
	Market 19	0.0127129	0.0126111	0.0125192	0.0124366	0.0123628	0.0122973	0.0122395	0.0121892	0.0121458	0.012109
	Market 20	0.0144035	0.014334	0.0142744	0.0142242	0.0141827	0.0141495	0.0141241	0.0141061	0.014095	0.0140906
	Market 21	0.0014569	0.0013198	0.0011927	0.0010749	0.0009658	0.000865	0.000772	0.0006864	0.0006077	0.0005357
	Market 22	0.0186724	0.0185617	0.018461	0.0183697	0.018287	0.0182127	0.0181461	0.0180869	0.0180347	0.0179891
	Market 23	0.0031424	0.0030249	0.0029174	0.0028191	0.0027296	0.0026484	0.002575	0.0025089	0.0024499	0.0023974
	Market 24	0.0014809	0.0013071	0.0011432	0.0009887	0.000843	0.0007055	0.0005758	0.0004535	0.0003381	0.0002294

Table D.7

Incremental Effects of PTAR, By Year

	Market 25	0.0075027	0.0074051	0.0073175	0.0072392	0.0071696	0.0071084	0.0070549	0.0070087	0.0069696	0.006937
	Market 26	0.0049044	0.0047513	0.004608	0.0044742	0.004349	0.0042322	0.0041231	0.0040214	0.0039267	0.0038386
	Market 27	0.0228277	0.0226682	0.0225186	0.0223784	0.0222469	0.0221237	0.0220083	0.0219002	0.0217991	0.0217047
	Market 28	0.0121552	0.0120023	0.0118594	0.0117258	0.0116009	0.0114843	0.0113755	0.0112741	0.0111797	0.0110918
	Market 29	0.0096708	0.0094724	0.0092838	0.0091046	0.0089342	0.008772	0.0086176	0.0084706	0.0083306	0.0081971
	Market 30	0.0151576	0.0149678	0.014788	0.0146175	0.0144557	0.0143023	0.0141566	0.0140182	0.0138869	0.0137622
Incremental Effect (W/O-W)	Market 1	0.0007	-0.0007	-0.0022	-0.0037	-0.0053	-0.0070	-0.0088	-0.0107	-0.0126	-0.0146
	Market 2	-0.0150	-0.0165	-0.0181	-0.0198	-0.0216	-0.0235	-0.0254	-0.0274	-0.0295	-0.0317
	Market 3	-0.0233	-0.0251	-0.0270	-0.0289	-0.0309	-0.0330	-0.0352	-0.0374	-0.0398	-0.0422
	Market 4	-0.0259	-0.0277	-0.0295	-0.0314	-0.0334	-0.0355	-0.0377	-0.0399	-0.0422	-0.0446
	Market 5	-0.0231	-0.0246	-0.0263	-0.0280	-0.0298	-0.0317	-0.0336	-0.0357	-0.0378	-0.0400
	Market 6	-0.0284	-0.0302	-0.0321	-0.0341	-0.0362	-0.0383	-0.0405	-0.0428	-0.0452	-0.0477
	Market 7	-0.0303	-0.0322	-0.0341	-0.0362	-0.0383	-0.0405	-0.0428	-0.0452	-0.0476	-0.0501
	Market 8	-0.0310	-0.0328	-0.0348	-0.0368	-0.0389	-0.0411	-0.0433	-0.0456	-0.0481	-0.0506
	Market 9	-0.0309	-0.0328	-0.0347	-0.0367	-0.0388	-0.0409	-0.0432	-0.0455	-0.0479	-0.0504
	Market 10	-0.0325	-0.0344	-0.0363	-0.0383	-0.0404	-0.0426	-0.0448	-0.0472	-0.0496	-0.0521
	Market 11	-0.0326	-0.0345	-0.0364	-0.0384	-0.0405	-0.0427	-0.0450	-0.0473	-0.0497	-0.0522
	Market 12	-0.0329	-0.0348	-0.0367	-0.0387	-0.0408	-0.0429	-0.0452	-0.0475	-0.0499	-0.0524
	Market 13	-0.0320	-0.0338	-0.0357	-0.0377	-0.0398	-0.0419	-0.0441	-0.0464	-0.0488	-0.0512
	Market 14	-0.0331	-0.0350	-0.0369	-0.0390	-0.0410	-0.0432	-0.0455	-0.0478	-0.0502	-0.0527
	Market 15	-0.0342	-0.0361	-0.0381	-0.0402	-0.0423	-0.0445	-0.0468	-0.0492	-0.0517	-0.0542
	Market 16	-0.0344	-0.0363	-0.0383	-0.0404	-0.0425	-0.0447	-0.0470	-0.0494	-0.0519	-0.0544
	Market 17	-0.0343	-0.0362	-0.0382	-0.0402	-0.0424	-0.0446	-0.0469	-0.0492	-0.0517	-0.0542
	Market 18	-0.0345	-0.0364	-0.0384	-0.0405	-0.0426	-0.0449	-0.0472	-0.0496	-0.0520	-0.0546
	Market 19	-0.0350	-0.0369	-0.0389	-0.0410	-0.0432	-0.0454	-0.0477	-0.0501	-0.0526	-0.0551
	Market 20	-0.0347	-0.0366	-0.0386	-0.0406	-0.0428	-0.0450	-0.0473	-0.0497	-0.0521	-0.0547
	Market 21	-0.0355	-0.0374	-0.0394	-0.0415	-0.0437	-0.0460	-0.0483	-0.0507	-0.0532	-0.0558
	Market 22	-0.0352	-0.0371	-0.0391	-0.0412	-0.0434	-0.0456	-0.0479	-0.0503	-0.0528	-0.0554
	Market 23	-0.0355	-0.0374	-0.0394	-0.0415	-0.0437	-0.0459	-0.0482	-0.0506	-0.0531	-0.0557
	Market 24	-0.0361	-0.0380	-0.0401	-0.0422	-0.0444	-0.0467	-0.0490	-0.0515	-0.0540	-0.0566
	Market 25	-0.0352	-0.0372	-0.0392	-0.0412	-0.0434	-0.0456	-0.0479	-0.0503	-0.0528	-0.0554
	Market 26	-0.0360	-0.0380	-0.0400	-0.0421	-0.0443	-0.0465	-0.0489	-0.0513	-0.0538	-0.0564
	Market 27	-0.0363	-0.0382	-0.0402	-0.0423	-0.0445	-0.0468	-0.0492	-0.0516	-0.0541	-0.0567
	Market 28	-0.0363	-0.0382	-0.0402	-0.0423	-0.0445	-0.0468	-0.0491	-0.0516	-0.0541	-0.0567
	Market 29	-0.0367	-0.0387	-0.0408	-0.0429	-0.0451	-0.0474	-0.0498	-0.0522	-0.0548	-0.0574
	Market 30	-0.0367	-0.0387	-0.0407	-0.0428	-0.0451	-0.0473	-0.0497	-0.0522	-0.0547	-0.0573

Table D.7
Incremental Effects of PTAR, By Year

Access Period

		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
W/PTAR	**Market 1**	0.0634681	0.0637168	0.0639744	0.0642405	0.0645146	0.0647961	0.0650847	0.0653799	0.0656815	0.065989
	Market 2	0.0439055	0.0440281	0.0441596	0.0442996	0.0444475	0.0446029	0.0447654	0.0449345	0.04511	0.0452914
	Market 3	0.022447	0.0223776	0.0223171	0.0222651	0.0222211	0.0221845	0.022155	0.0221321	0.0221156	0.022105
	Market 4	0.0408485	0.0407919	0.0407443	0.0407051	0.0406739	0.0406502	0.0406335	0.0406235	0.0406198	0.0406222
	Market 5	0.0202055	0.0203108	0.020425	0.0205477	0.0206783	0.0208164	0.0209616	0.0211134	0.0212715	0.0214357
	Market 6	0.0310131	0.0309086	0.0308131	0.0307261	0.030647	0.0305753	0.0305108	0.0304529	0.0304013	0.0303557
	Market 7	0.0472228	0.0470682	0.0469227	0.0467856	0.0466564	0.0465348	0.0464201	0.0463122	0.0462106	0.0461149
	Market 8	0.0324635	0.032329	0.0322036	0.0320867	0.0319776	0.0318761	0.0317816	0.0316938	0.0316123	0.0315368
	Market 9	0.0389843	0.0388606	0.0387458	0.0386396	0.0385412	0.0384504	0.0383666	0.0382894	0.0382186	0.0381538
	Market 10	0.0474993	0.0473667	0.047243	0.0471278	0.0470205	0.0469207	0.046828	0.046742	0.0466622	0.0465885
	Market 11	0.0376686	0.0375345	0.0374095	0.0372929	0.0371842	0.037083	0.0369889	0.0369014	0.0368203	0.0367451
	Market 12	0.0370161	0.0368902	0.0367733	0.0366649	0.0365644	0.0364714	0.0363854	0.0363061	0.0362332	0.0361662
	Market 13	0.0365774	0.0364785	0.0363887	0.0363072	0.0362338	0.0361678	0.0361088	0.0360565	0.0360106	0.0359706
	Market 14	0.0474014	0.0472688	0.0471452	0.04703	0.0469228	0.0468231	0.0467304	0.0466444	0.0465647	0.0464909
	Market 15	0.0434688	0.0432942	0.0431287	0.0429715	0.0428224	0.0426806	0.042546	0.042418	0.0422964	0.0421807
	Market 16	0.0265259	0.026357	0.026197	0.0260456	0.025902	0.0257659	0.0256369	0.0255146	0.0253986	0.0252885
	Market 17	0.0419903	0.0418278	0.0416744	0.0415294	0.0413923	0.0412627	0.0411402	0.0410244	0.0409148	0.0408113
	Market 18	0.0303993	0.0302247	0.0300591	0.029902	0.0297528	0.029611	0.0294764	0.0293484	0.0292267	0.029111
	Market 19	0.0437311	0.0435494	0.0433768	0.0432126	0.0430563	0.0429075	0.0427658	0.0426307	0.042502	0.0423792
	Market 20	0.0450333	0.0448672	0.0447102	0.0445615	0.0444209	0.0442877	0.0441615	0.044042	0.0439289	0.0438217
	Market 21	0.0284692	0.0282705	0.0280809	0.0278997	0.0277264	0.0275606	0.0274019	0.0272498	0.0271041	0.0269644
	Market 22	0.0519574	0.0517715	0.0515946	0.0514261	0.0512656	0.0511126	0.0509666	0.0508273	0.0506943	0.0505673
	Market 23	0.0326829	0.0324937	0.0323135	0.0321417	0.0319779	0.0318215	0.0316722	0.0315296	0.0313933	0.031263
	Market 24	0.0316087	0.0313923	0.031185	0.0309861	0.0307952	0.0306117	0.0304353	0.0302655	0.0301021	0.0299447
	Market 25	0.0391707	0.0389911	0.0388205	0.0386583	0.0385041	0.0383573	0.0382177	0.0380847	0.037958	0.0378373
	Market 26	0.0346537	0.0344474	0.03425	0.034061	0.03388	0.0337065	0.03354	0.0333802	0.0332267	0.0330792
	Market 27	0.056458	0.0562486	0.0560481	0.0558561	0.055672	0.0554955	0.0553259	0.0551631	0.0550065	0.054856
	Market 28	0.0440925	0.0438862	0.043689	0.0435002	0.0433193	0.0431459	0.0429796	0.0428199	0.0426666	0.0425192
	Market 29	0.0421849	0.0419567	0.0417374	0.0415266	0.0413238	0.0411284	0.0409401	0.0407585	0.0405831	0.0404138
	Market 30	0.049822	0.0495979	0.0493829	0.0491763	0.0489776	0.0487864	0.0486023	0.0484249	0.0482537	0.0480886
W/O PTAR	**Market 1**	0.0770247	0.0780412	0.0790667	0.0801006	0.0811425	0.0821918	0.0832482	0.0843113	0.0853807	0.0864561
	Market 2	0.039322	0.0400304	0.0407478	0.0414736	0.0422073	0.0429486	0.0436968	0.0444518	0.0452131	0.0459803
	Market 3	0.0081868	0.0084261	0.0086745	0.0089312	0.009196	0.0094682	0.0097474	0.0100333	0.0103256	0.0106238
	Market 4	0.0236085	0.0238792	0.024159	0.0244471	0.0247432	0.0250468	0.0253575	0.0256748	0.0259984	0.026328
	Market 5	0.0062264	0.0068925	0.0075676	0.0082511	0.0089426	0.0096416	0.0103476	0.0110602	0.0117792	0.0125042
	Market 6	0.0108545	0.0110082	0.0111709	0.0113421	0.0115212	0.0117077	0.0119014	0.0121017	0.0123083	0.0125209
	Market 7	0.0248734	0.0249049	0.0249453	0.0249942	0.025051	0.0251153	0.0251866	0.0252646	0.025349	0.0254393
	Market 8	0.009346	0.0094266	0.0095162	0.0096142	0.0097202	0.0098337	0.0099542	0.0100814	0.0102149	0.0103544
	Market 9	0.0159074	0.0160141	0.0161298	0.016254	0.0163861	0.0165257	0.0166723	0.0168256	0.0169853	0.0171509
	Market 10	0.0226016	0.0226865	0.0227804	0.0228828	0.0229931	0.0231109	0.0232357	0.0233672	0.023505	0.0236488
	Market 11	0.0126263	0.0127078	0.0127982	0.0128972	0.013004	0.0131184	0.0132398	0.0133678	0.0135022	0.0136426
	Market 12	0.0116389	0.0117403	0.0118508	0.0119697	0.0120965	0.0122308	0.0123721	0.0125202	0.0126745	0.0128349
	Market 13	0.0122245	0.0123919	0.0125684	0.0127532	0.0129461	0.0131464	0.0133537	0.0135678	0.0137881	0.0140145
	Market 14	0.0217561	0.0218411	0.0219351	0.0220376	0.022148	0.0222658	0.0223908	0.0225224	0.0226603	0.0228042
	Market 15	0.0166023	0.0165848	0.0165762	0.0165762	0.0165841	0.0165994	0.0166218	0.0166509	0.0166863	0.0167277
	Market 16	-0.0005973	-0.0006011	-0.0005958	-0.0005821	-0.0005605	-0.0005314	-0.0004952	-0.0004523	-0.0004032	-0.000348
	Market 17	0.014987	0.0149992	0.0150203	0.0150498	0.0150873	0.0151323	0.0151844	0.0152431	0.0153081	0.0153791
	Market 18	0.0031549	0.0031374	0.0031288	0.0031287	0.0031365	0.0031518	0.0031741	0.0032032	0.0032385	0.0032798
	Market 19	0.0159093	0.0158745	0.0158487	0.0158313	0.0158219	0.01582	0.0158251	0.0158368	0.0158549	0.015879
	Market 20	0.0175873	0.0175906	0.0176029	0.0176236	0.0176523	0.0176884	0.0177316	0.0177815	0.0178376	0.0178998
	Market 21	0.0001097	3.338E-05	-3.395E-05	-9.283E-05	-0.0001438	-0.0001872	-0.0002236	-0.0002534	-0.0002768	-0.0002942
	Market 22	0.0239199	0.0238747	0.0238385	0.0238107	0.0237909	0.0237786	0.0237733	0.0237747	0.0237824	0.0237961
	Market 23	0.0043405	0.0042872	0.0042429	0.0042071	0.0041792	0.0041588	0.0041455	0.0041388	0.0041384	0.0041441
	Market 24	0.0025592	0.0024397	0.0023291	0.002227	0.0021329	0.0020462	0.0019666	0.0018936	0.001827	0.0017663

Table D.7
Incremental Effects of PTAR, By Year

	Market 25	0.011089	0.0110592	0.0110384	0.011026	0.0110216	0.0110246	0.0110348	0.0110516	0.0110747	0.0111038
	Market 26	0.0056955	0.0056002	0.005514	0.0054362	0.0053663	0.0053039	0.0052486	0.0051999	0.0051576	0.0051213
	Market 27	0.0272099	0.0271072	0.0270134	0.0269282	0.0268508	0.0267809	0.0267181	0.026662	0.0266122	0.0265684
	Market 28	0.014848	0.014753	0.0146671	0.0145896	0.0145201	0.014458	0.014403	0.0143547	0.0143127	0.0142766
	Market 29	0.0123782	0.0122295	0.0120899	0.0119588	0.0118355	0.0117198	0.0116111	0.011509	0.0114133	0.0113236
	Market 30	0.020064	0.0199256	0.0197962	0.0196753	0.0195623	0.0194568	0.0193583	0.0192666	0.0191811	0.0191016
Incremental	Market 1	0.0136	0.0143	0.0151	0.0159	0.0166	0.0174	0.0182	0.0189	0.0197	0.0205
Effect	Market 2	-0.0046	-0.0040	-0.0034	-0.0028	-0.0022	-0.0017	-0.0011	-0.0005	0.0001	0.0007
(W/O-W)	Market 3	-0.0143	-0.0140	-0.0136	-0.0133	-0.0130	-0.0127	-0.0124	-0.0121	-0.0118	-0.0115
	Market 4	-0.0172	-0.0169	-0.0166	-0.0163	-0.0159	-0.0156	-0.0153	-0.0149	-0.0146	-0.0143
	Market 5	-0.0140	-0.0134	-0.0129	-0.0123	-0.0117	-0.0112	-0.0106	-0.0101	-0.0095	-0.0089
	Market 6	-0.0202	-0.0199	-0.0196	-0.0194	-0.0191	-0.0189	-0.0186	-0.0184	-0.0181	-0.0178
	Market 7	-0.0223	-0.0222	-0.0220	-0.0218	-0.0216	-0.0214	-0.0212	-0.0210	-0.0209	-0.0207
	Market 8	-0.0231	-0.0229	-0.0227	-0.0225	-0.0223	-0.0220	-0.0218	-0.0216	-0.0214	-0.0212
	Market 9	-0.0231	-0.0228	-0.0226	-0.0224	-0.0222	-0.0219	-0.0217	-0.0215	-0.0212	-0.0210
	Market 10	-0.0249	-0.0247	-0.0245	-0.0242	-0.0240	-0.0238	-0.0236	-0.0234	-0.0232	-0.0229
	Market 11	-0.0250	-0.0248	-0.0246	-0.0244	-0.0242	-0.0240	-0.0237	-0.0235	-0.0233	-0.0231
	Market 12	-0.0254	-0.0251	-0.0249	-0.0247	-0.0245	-0.0242	-0.0240	-0.0238	-0.0236	-0.0233
	Market 13	-0.0244	-0.0241	-0.0238	-0.0236	-0.0233	-0.0230	-0.0228	-0.0225	-0.0222	-0.0220
	Market 14	-0.0256	-0.0254	-0.0252	-0.0250	-0.0248	-0.0246	-0.0243	-0.0241	-0.0239	-0.0237
	Market 15	-0.0269	-0.0267	-0.0266	-0.0264	-0.0262	-0.0261	-0.0259	-0.0258	-0.0256	-0.0255
	Market 16	-0.0271	-0.0270	-0.0268	-0.0266	-0.0265	-0.0263	-0.0261	-0.0260	-0.0258	-0.0256
	Market 17	-0.0270	-0.0268	-0.0267	-0.0265	-0.0263	-0.0261	-0.0260	-0.0258	-0.0256	-0.0254
	Market 18	-0.0272	-0.0271	-0.0269	-0.0268	-0.0266	-0.0265	-0.0263	-0.0261	-0.0260	-0.0258
	Market 19	-0.0278	-0.0277	-0.0275	-0.0274	-0.0272	-0.0271	-0.0269	-0.0268	-0.0266	-0.0265
	Market 20	-0.0274	-0.0273	-0.0271	-0.0269	-0.0268	-0.0266	-0.0264	-0.0263	-0.0261	-0.0259
	Market 21	-0.0284	-0.0282	-0.0281	-0.0280	-0.0279	-0.0277	-0.0276	-0.0275	-0.0274	-0.0273
	Market 22	-0.0280	-0.0279	-0.0278	-0.0276	-0.0275	-0.0273	-0.0272	-0.0271	-0.0269	-0.0268
	Market 23	-0.0283	-0.0282	-0.0281	-0.0279	-0.0278	-0.0277	-0.0275	-0.0274	-0.0273	-0.0271
	Market 24	-0.0290	-0.0290	-0.0289	-0.0288	-0.0287	-0.0286	-0.0285	-0.0284	-0.0283	-0.0282
	Market 25	-0.0281	-0.0279	-0.0278	-0.0276	-0.0275	-0.0273	-0.0272	-0.0270	-0.0269	-0.0267
	Market 26	-0.0290	-0.0288	-0.0287	-0.0286	-0.0285	-0.0284	-0.0283	-0.0282	-0.0281	-0.0280
	Market 27	-0.0292	-0.0291	-0.0290	-0.0289	-0.0288	-0.0287	-0.0286	-0.0285	-0.0284	-0.0283
	Market 28	-0.0292	-0.0291	-0.0290	-0.0289	-0.0288	-0.0287	-0.0286	-0.0285	-0.0284	-0.0282
	Market 29	-0.0298	-0.0297	-0.0296	-0.0296	-0.0295	-0.0294	-0.0293	-0.0292	-0.0292	-0.0291
	Market 30	-0.0298	-0.0297	-0.0296	-0.0295	-0.0294	-0.0293	-0.0292	-0.0292	-0.0291	-0.0290

V. VARIABLE DEFINITIONS AND TECHNICAL ISSUES

A. VARIABLE DEFINITIONS AND NOTATION

The variables are defined as follows.

Variable Notation in Equation (1)	Variable Definition and Notation in the Result Tables 3-5 of the Text

P_{mt}	The performance measure of independent stations in market m and year t, defined alternatively as:
	• $Nind_{mt}$ the number of independent stations in market m and year t.
	• $Pnind_{mt}$ the percent of total independent stations operating in market m and year t, where $Pnind_{mt} = Nind_{mt} / Nind_{m,1993}$.
	• $AVRATSTA_{mt}$ the rating of the average independent station in market m and year t. The average is taken over all independent stations in market m and year t for all weekdays in November of year t. The average is taken for the access period (one half hour) and for all programming periods (three one half hours).
	• $AVSUMRAT_{mt}$ the aggregate rating of all independent stations in market m and year t. The average is taken over all weekdays in November of year t in market m. The average is taken for the access period (one half hour) and for all programming periods (three one half hours).
	• X_t, Z_m The independent variables for market m and year t, including defined as:
	  • Real per capita income: PCI_{mt}
	  • TV Households (HH): $TVHH_{mt}$
	  • Percentage of TVHH with cable: $\%CAB_{mt}$
	  • Time (years) since implementation of PTAR, where

$T71_t = 0$, t = 1966-1970;
$T71_t = 1$, t = 1971;
$T71_t = 2$, t = 1972;

. .

$T71_t = 23$, t = 1993.

- PTAR $Dummy_{mt}$ Binary Variable summarizing the presence or absence of PTAR in market m and year t
- PTAR $Dummy_{mt} = 1$ for all top 30 markets and years t = 1971-1993
- PTAR $Dummy_{mt} = 0$, otherwise.

B. DATA SOURCES

The primary source of data for the means and econometric analyses is the Arbitron data base described in **Appendix C**. The station and program specific information was augmented with information for each market on size, per capita income, cable penetration, and UHF penetration.

C: ISSUES OF ECONOMETRIC SPECIFICATION

1. Alternative functional specifications

In **Section III**, we give greater specificity to our regression equation,

Equation (D.1) $P_{mts} = F(X_t, Z_m, \text{PTAR Dummy}_{mt})$.

The alternatives we use for F are the following:

F is linear

In this case, we have

Equation (D.2) $P_{mt} = a'X_t + b'Z_m + d\ \text{PTAR Dummy}_{mt} + e_{mt}$,

where e_{mt} summarizes all residual error.

F is nonlinear and logistic

In this case, we have

Equation (D.3) $P_{mt} = 1/\{1 + \exp(-1*[a'X_t + b'Z_m + d\ \text{PTAR Dummy}_{mt}])\}$.

If the form of our dependent variable, P_{mt}, is continuous (it is measured as a proportion), we shall estimate **Equation (D.2)** as follows[23]:

Equation (D.4) $\text{Log}\,(P_{mt}/(1-P_{mt})) = a'X_t + b'Z_m + d\ \text{PTAR Dummy}_{mt} + e_{mt}$.

Alternatively, if the form of our dependent variable, P_{mt}, is binary (it is measured as either 0 or 1), we shall estimate **Equation (D.3)** using standard maximum likelihood techniques.

2. Stochastic issues -- weighted least squares estimation

For the regression models described by **Equations (D.2)** and **(D.3)**, we have $E(e_{mt}) = 0$. However, $V(e_{mt}) \neq s^2$. Hence, OLS is unbiased but inefficient. Weighted least squares (WLS) is required for efficiency.

The WLS weights are well established for these cases.[24] Let w_{mt} denote the relevant weight, each of which is formulated as follows:

Equation (D.5) Linear: $w_{mt} = \{TVHH_{mt}/[P_{mt}(1-P_{mt})]\}^{1/2}$

Equation (D.6) Logistic: $w_{mt} = \{TVHH_{mt} * P_{mt} * (1-P_{mt})\}^{1/2}$.

Using these formulae for the weights, WLS estimators are calculated as follows:

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[23] Because $P_{mt} = 1/(1 + \exp(.))$, we have $1/P_{mt} = 1 + \exp(.)$ and $(1-P_{mt})/P_{mt} = \exp(.)$.

[24] See, for example, G. S. Maddala, Limited-Dependent and Qualitative Variables in Econometrics, Cambridge University Press, 1983, pp. 28-30.